

Our Reference: KSK-104-A

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Siegfried Mielke
Serial Number:	10/789,277
Filing Date:	February 27, 2004
Examiner/Group Art Unit:	John C. Hong/3726
Title:	MANUFACTURING PROCESS FOR COOLING CHANNEL PISTON WITH FORMABLE

AMENDED APPEAL BRIEF

Hon. Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Please enter the following Amended Appeal Brief in the Appeal filed on June 12, 2007.

REAL PARTY IN INTEREST

The real party in interest is KS Kolbenschmidt GmbH, by assignment from inventor Siegfried Mielke.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences in the present application.

STATUS OF CLAIMS

Claim 1-8 are pending in the Application. Claims 1-8 are rejected under 35 USC 112, second paragraph. Claims 1 and 6-8 are rejected under 35 USC 103(a) as being unpatentable over German Patent Number DE 1210302 ('302) in view of United States Patent Number (U.S.P.N.) 4,662,047. Claims 2-5 are rejected under 35 USC 103(a) as being unpatentable over German Patent DE 1210301 as applied to claim 1 and further in view of the Mechanical Engineer's Handbook. Claims 1-8 are on appeal.

STATUS OF AMENDMENTS

An Amendment after final was filed on May 11, 2007 and was entered per phone call from Examiner on July 31, 2007 and the interview summary dated August 3, 2007.

SUMMARY OF THE CLAIMED SUBJECT MATTER

(The Paragraph numbers refer to the Substitute Specification dated January 10, 2007 and later amended in the amendment dated May 11, 2007.)

Independent claim 1 defines a process for manufacturing a cooling channel piston 1 (Paragraph 15), which has a cooling channel 7 approximately in the area behind a ring belt 9, (Paragraph 18) where a piston blank 1 is shaped at least partially in a forging process (Paragraph 15), characterized in that specifically in the area of a top land, at least one circumferential shoulder 5, 10 projecting laterally from the piston blank 1 is formed, behind the at least one shoulder 5, 10 a recess is introduced from the side, (Paragraph 16) and then the at least one shoulder 5, 10 is reshaped by means of deformation such that the recess is closed by the at least one shoulder 5,10 to create the cooling channel (Paragraph 17).

Dependent claims 2, 3, 4 and 5 define the reshaping process by forging, (Paragraph 6, 18) swaging, driving through a hollow form and pressure rolling (Paragraph 6) respectively.

Dependent claim 6 defines that the at least one shoulder 5, 10 is rigidly connected to the piston blank 1 or to another shoulder 5, 10 forming a contact area 8 (Paragraph 17).

Dependent claim 8 defines that the shoulder 5, 10 is furnished with sealing means 9 in the contact area 8 with respect to the piston blank (Paragraph 18, Figure 9).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1-8 stand rejected under 35 USC 112, second paragraph.
2. Claims 1 and 6-8 stand rejected under 35 USC 103(a) as being unpatentable over German Patent No. DE 1210302 in view of Berchem (U.S.P.N. 4,662,047).
3. Claims 2-5 stand rejected under 35 USC 103 (a) as being unpatentable over German Patent No. DE 1210302 (DE '302) in view of Berchem (U.S.P.N. 4,662,047) and further in view of the Mechanical Engineer's Handbook.

ARGUMENT

Issue 1 Rejection of Claims 1-8 under 35 USC 112, 2nd paragraph

Claims 1-8 are rejected under 35 USC 112, 2nd paragraph. The § 112 rejection is addressed in this Appeal Brief because the record is unclear whether the Amendment filed on May 11, 2007 overcame the aforementioned rejection. Further information would be welcomed in the Examiner's answer to this brief regarding the §112, 2nd paragraph rejection. The Examiner objected to the term "top land" as being unclear and the term "the sides" lacking antecedent basis. For the following reasons, the appellant believes that the Amendment after Final overcomes the § 112 rejection.

"Top land" is a term of art known in the industry for defining the vertical space of a piston that separates the combustion area and the top groove. The term "top land" is illustrated and discussed in the attached evidence (Appendix B) which include website articles defining the term "top land".

The Examiner further rejected claim 1 as stating that the term "the side" had no antecedent basis. The term "the side" was amended to read "a side" in the Amendment after Final dated May 11, 2007.

Issue 2: Rejection of Claims 1 and 6-8:

Claims 1 and 6-8 are rejected under 35 USC 103(a) as being unpatentable over German patent DE 1210302 ('302) in view of Berchem (U.S.P.N. 4,662,047) '047. The Examiner states that with respect to claim 1, DE '302 teaches a process for manufacturing a cooling channel piston which has a cooling channel approximately behind a ring belt, the piston blank is shaped at least partially in a forging process, and that specifically in the approximate area of a top land, behind the at least one shoulder a recess introduced from the side and the at least one shoulder is reshaped by means of a deformation such that the recess is closed by at least one shoulder to create the cooling channel. The Examiner states that Berchem teaches at least one circumferential shoulder 13 projecting laterally from the piston blank. The Examiner states that it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the step of forming at least one circumferential shoulder projecting laterally from the piston blank.

DE '302 shows inner (d) and outer (e) shaft parts which when abutted together along their length, as in Fig. 3, provide for a closed channel (h).

The Examiner admits that DE '302 fails to teach at least one circumferential shoulder projecting laterally from the piston blank, but states that the Berchem reference teaches the at least one circumferential shoulder (2) projecting laterally from the piston blank.

However, Berchem does not disclose reshaping the shoulder (2) to close a recess to form the cooling channel. The shoulder 2 or 7 in Berchem only forms an annular gap (6). There is no connection of the free end of the shoulder 2,7 to enclose the gap 6 in Berchem to provide a closed cooling channel. Therefore, even if one could combine the teaching of Berchem with DE

'302, the claim process would not be provided since the gap 6 formed in Berchem is not a closed channel.

Further there is no suggestion how to combine the teaching of Berchem to the teaching of DE '302 to meet the claimed process. Reference DE '302 already discloses forming a cooling channel (h) between the inner and outer shaft parts. Therefore, there would be no motivation to add the shoulder 2 or 7 to either of the inner or outer shafts to form an annular gap in addition to the cooling channel (h). The piston reference DE '302 would require major modification, reconstruction or design to accommodate the teachings of Berchem. For these reasons, it is respectfully submitted that the Examiner has failed to establish a prima facie case of obviousness to support a rejection of Appellant's invention as set forth in claim 1 over the combination of DE '302 and Berchem (4,662,047). The remaining dependent claims 6-8 of Issue 2 are patentable over the cited art for the same reasons as claim 1.

In addition to being patentable for the same reasons as claim 1, claim 8 is also patentable because the seal (f) in DE '302 is not located on a shoulder as featured in claim 8. The seal (f) is along the vertical inner wall (d) of the piston. Berchem does not show or disclose a seal. Therefore the combination of DE'302 and Berchem does not render claim 8 obvious. For this reason, it is respectfully submitted that the Examiner has failed to establish a prima facie case of obviousness to support a rejection of Appellant's invention as set forth in claim 8 over the combination of DE '302 and Berchem (4,662,047).

Issue 3: Rejection of Claims 2-5

Claims 2-5 are rejected under 35 USC 103(a) as being unpatentable over German DE '302 in view of Berchem (U.S.P.N. 4,662,047) and further in view of the Mechanical Engineer's Handbook.

Claims 2-5 are dependent claims, dependent on claim 1 and patentable over the cited art for the same reasons as claim 1.

CONCLUSION

For the reasons set forth above, it is respectfully submitted that Appellant's invention as set forth in claims 1-8 patentably defines over the cited references and is not anticipated, suggested or rendered obvious thereby. As such it is respectfully submitted that the Examiner's final rejection of claims 1-8 is erroneously based and its reversal is respectfully requested.

No oral hearing is requested.

The amount of \$500.00 to cover the Appeal Brief filing fee may be charged to the appellant's attorney's deposit account number 25-0115. Please charge any other deficiencies to the same aforementioned deposit account number.

Respectfully submitted,

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APPENDIX A: CLAIMS AT ISSUE IN APPEAL

1. Process for manufacturing a cooling channel piston which has a cooling channel approximately in the area behind a ring belt, where a piston blank is shaped at least partially in a forging process, characterized in that specifically in the approximate area of a top land, at least one circumferential shoulder projecting laterally from the piston blank is formed, behind the at least one shoulder a recess is introduced from a side and then the at least one shoulder is reshaped by means of deformation such that the recess is closed by the at least one shoulder to create the cooling channel.
2. Process in accordance with claim 1, wherein the reshaping takes place by forging.
3. Process in accordance with claim 1, wherein the reshaping takes place by swaging.
4. Process in accordance with claim 1, wherein the reshaping takes place by driving through a hollow form.
5. Process in accordance with claim 1, wherein the reshaping takes place by pressure rolling.
6. Process in accordance with claim 1, wherein the at least one shoulder is rigidly connected to said piston blank or to another shoulder forming a contact area.
7. Process in accordance with claim 6, wherein the contact area is reworked.
8. Process in accordance with claim 6, wherein the shoulder is furnished with

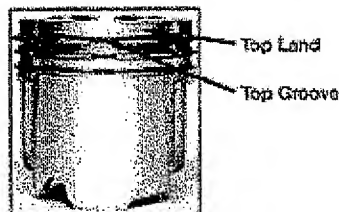
sealing means in the contact area with respect to the piston blank.

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Piston Anatomy

Top Land The vertical space of the piston that separates the combustion area and the top groove.



Top Groove The Top Groove houses the compression ring. At the time of combustion, exhaust gases move behind the ring and push it out creating a tight seal for optimal compression.

Undercrown The under-side area of the piston where engine oil is sprayed to keep the piston from over-heating.

Piston Deposits Equals Inferior Performance**Top Land**

- Impede the gas flow to the compression ring
- Increase cylinder wear/bore polishing
- Decrease engine efficiency and engine life

Top Groove Deposits

- Cause rings to stick
- Cause exhaust gases to blow by the compression ring
 - ▶ Increasing *acidity* in the oil
 - ▶ Increasing *soot* in the oil
 - ▶ Increasing the temperature and *oxidation* rate of the oil
 - ▶ Increasing oil consumption
- Decrease engine compression efficiency and engine oil

**Undercrown Deposits**

- Impede the heat transfer function of the oil
- Cause the engine to run hotter
- Decrease engine efficiency and engine oil

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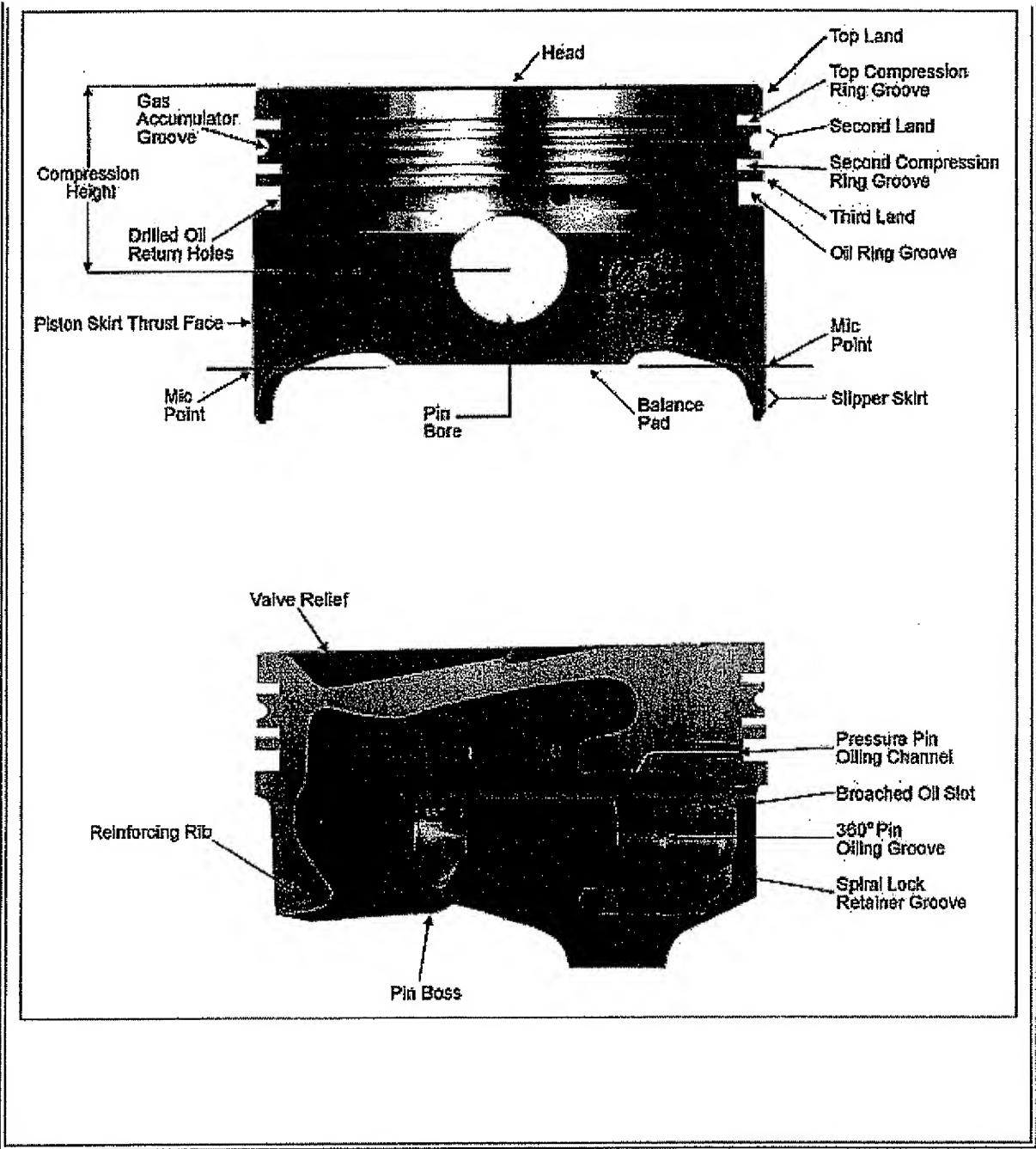
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Pistons

Piston Terminology



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V-8 Piston Orientation	Spiral Retaining Ring Installation Tips
Oil Ring Installation with Roll Pin Locator	

Technical Stuff	
Piston Cooling with BLP Oil Spray System	SPARK PLUGS
PRE-IGNITION DAMAGE -- HOLE IN HEAD OF PISTON	UNDERSTANDING WHAT RING END GAP REALLY MEANS
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PISTON ALLOYS AND HIGH PERFORMANCE	COMPRESSION RATIO -vs- COMPRESSION PRESSURE
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<u>Piston Terminology</u>	Hypereutectic -vs- Forged Pistons
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APPENDIX C RELATED PROCEEDINGS

NONE